**Remarks**

Claims 1-18 are before the Examiner for consideration.

**Rejection under 35 U.S.C. §103(a)**

Claims 1-3, 5-7, 10-11, 15-16, and 18 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,810,576 to Gaa, *et al.* ("Gaa") in view of U.S. Patent No. 5,853,133 to Smith ("Smith"). The Examiner asserts that Gaa discloses a method of making a chopped strand mat that includes the step of dispersing chopped strand glass in white water. It is asserted that the chopped strand glass fibers are dried after sizing with a liquid that includes an organosilane and a film former. Additionally, it is asserted that the fibers are formed into a web on a forming wire where a binder is applied and the web is heat treated. The Examiner admits that Gaa does not clearly teach applying the size to glass strands where a strand is an assembly of glass fibers. In this regard, the Examiner cites Smith for assertedly teaching that in forming sized glass fiber strands, the glass fibers can be formed into a strand and then sized. The Examiner concludes that it would have been obvious to one of skill in the art to apply the size to the formed strands as taught by Smith rather than prior to strand formation.

In response to this rejection, Applicant respectfully directs the Examiner's attention to claim 1 and submits that claim 1 defines a process for preparing a chopped strand mat that is not taught or suggested within Gaa and/or Smith. Additionally, Applicant respectfully submits that Gaa and Smith do not teach or suggest the combination of features recited in claim 1.

In the outstanding Office Action, the Examiner admits that Gaa does not clearly teach applying the size to glass strands. (*See* page 4, lines 4-7 of the Office Action dated November 12, 2008). In response thereto, Applicant respectfully submits that even though Gaa states at column 5, lines 2-3 that "[h]ereinafter, in the specification and Claims, both fibers and strands will be reference collectively as fibers", in column 11, lines 49-63, Gaa clearly and unequivocally teaches the application of the size composition to the *fibers* after they are formed and prior to their formation into a *strand.* In at least this teaching within Gaa, the term "fiber" and "strand" cannot be interchangeably used. In column 4, lines 60-64 (*i.e.*, prior to Gaa's statement that fibers and strands will be collectively referred to as "fibers"), Gaa teaches that the aqueous chemical treatment is on the *glass fiber* in the strand.

Thus, it is respectfully submitted that Gaa clearly and specifically teaches the application of a size composition to the individual glass fibers, not to the strand.

Turning to Smith, Applicant submits that Smith also does not teach or suggest the application of a size composition to strands as is required by claim 1. Smith teaches drawing glass fibers from orifices in a bushing and gathering them into a strand. (*See, e.g.*, column 4, lines 6-9). An applicator applies a size composition *to the fibers* (emphasis added) after attenuation from the bushing. (*See, e.g.*, column 4, lines 9-11). Applicant submits that this application of the size composition to the individual glass fibers in Smith is very different from the application of a sizing liquid to strands formed of an assembly of contiguous fibers as claimed in claim 1. Indeed, the application of an aqueous composition to individual fibers is the opposite of applying a sizing liquid to strands formed of contiguous filaments.

Further, it is clear from FIG. 1 of Smith that the fibers 10 are sized by a size applicator 18, then gathered into a strand 14 by a gathering shoe 16, located downstream of applicator 18, and wound around a collet 22 to form a package 19. (*See also* column 4, lines 6-14). No where in Smith is there any teaching or even a suggestion of applying the size composition to the gathered strands. Indeed, the strand 14 is formed after the application of the size by size applicator 18. (*See, e.g.*, FIG. 1). Accordingly, the strand 14 cannot be sized by the size composition in Smith.

It is therefore respectfully submitted that neither Gaa nor Smith teaches or suggests sizing strands with a sizing liquid to form sized strands where the strands contain an assembly of contiguous filaments as is required by claim 1. Indeed, both Gaa and Smith are silent with respect to any teaching or suggestion of sizing glass strands with a size composition. Accordingly, it is respectfully submitted that even if Smith were combined with Gaa, the combination would not result in the process for preparing a chopped strand mat claimed in claim 1. Thus, it is respectfully submitted that claim 1, and all claims dependent therefrom, are non-obvious and patentable.

Additionally, Applicant respectfully submits that Gaa teaches away from the process claimed in claim 1 in which the chopped strand mat is formed of a web of chopped strands. As taught on page 1, lines 10-12 of the specification, the goal of the invention is to ensure that in the mat the individual filaments are assembled as far as possible in the form of strands. The aim of the present invention, therefore, is "to minimize the amount of individual filaments". (See page 1, lines 12-14). Applicant's method advantageously provides a

chopped strand mat that contains "at least 80%, or even 90% by weight of the filaments" in the form of strands (i.e., an assembly of contiguous filaments). (See, e.g., page 8, line 37 to page 9, line 2). Thus, the mat formed by the process of the present invention is nearly entirely formed of chopped strands. Applicant's method also advantageously provides a very uniform mat of chopped strands (See, e.g., page 8, lines 30-31) that in turn can be used to produce a composite product with high bending strength, high tensile strength, and high impact strength (See, e.g., page 9, lines 11-17).

In contrast, Gaa teaches that a lack of good dispersion of the glass fibers in the aqueous medium "hampers the formation of a uniform mat and adversely affects the strength of the resultant sheet-like mat or end product incorporating the mat". (See column 2, lines 61-65). Gaa further teaches that one object of the invention is to provide fibers in the form of improved choppable bundles of fibers, and also to provide glass fibers that have good dispersibility in the aqueous medium. (See, e.g., column 3, lines 12-16 and 33-36, and column 4, lines 48-58). The dispersion of the glass fibers is achieved by merely placing the chopped glass fibers into a batch of water with or without dispersing aids to disperse the fibers for use in a wet-laid process or other paper making process. (See, e.g., column 12, lines 11-17).

It is respectfully submitted that one of skill in the art reading Gaa would not arrive at the process of the present invention. Indeed, one of skill in the art would be drawn away from forming a mat of chopped strands because Gaa expressly teaches the dispersion of the fibers in an aqueous medium. Applicant submits that this dispersion of fibers teaches away from the process of the present invention where the sizing composition maintains the glass fiber bundles throughout the mat forming process. Moreover, in Gaa, the aim of the invention is to have good dispersibility and improve choppability of the chopped strands, whereas the aim of the present invention is to minimize the amount of individual filaments in the mat. Smith simply cannot make up for the deficiencies of Gaa. As such, it is respectfully submitted that claim 1, and all claims dependent therefrom, are not obvious over Gaa and Smith for these additional reasons.

Additionally, Applicant respectfully submits that Gaa does not teach or suggest forming a web by passing a white water dispersion containing chopped strands over a forming wire where the chopped strands are retained on the forming wire. As discussed above, Gaa specifically teaches placing chopped glass fibers into water (with or without

dispersing aids) to form a dispersion of glass fibers for use in a wet-laid process. (*See, e.g.*, column 12, lines 11-17). Thus, in Gaa, individual glass fibers are dispersed in the water, *not* chopped strands as claimed in claim 1. Moreover, the dispersion of glass fibers in Gaa forms a non-woven sheet-like mat, which, Applicant submits, is vastly different from the chopped strand mat of the present invention. (*See, e.g.*, column 13, lines 8-10 and 46-50). In particular, the mat of Gaa is an assembly of individual fibers whereas in claim 1, chopped strands are retained on the forming wire to form a web of chopped strands. In claim 1, the web of chopped strands is then treated with a binder and heat treated to form a chopped strand mat. Accordingly, chopped strands are present in the chopped strand mat formed by the process of claim 1, not glass filaments as taught in Gaa. Indeed, it is the aim of the present invention to minimize the number of individual filaments in the mat. (*See, e.g.*, page 1, lines 10-15). Smith is silent with respect to any teaching or suggestion of forming a chopped strand mat. As such, Smith cannot make up for the deficiencies of Gaa. Additionally, Applicant respectfully submits that the combination of the teachings of Gaa and Smith would not result in the inventive process of forming a chopped strand mat recited in claim 1. As such, Applicant submits that claim 1 is non-obvious and patentable over Gaa and Smith for this additional reason.

In addition, Applicant respectfully submits that there is no motivation for one of skill in the art to arrive at a process for preparing a chopped strand mat as claimed in claim 1 based on the teachings of Gaa and Smith. To establish a *prima facie* case of obviousness, there must be some motivation, either within the reference or in the knowledge of those of skill in the art, to modify the reference or combine the references' teachings, there must be a reasonable expectation of success, and the prior art references must meet all of the claim limitations. (*See, e.g., Manual of Patent Examining Procedure*, Patent Publishing, LLC, Eighth Ed., Rev. 6, August 2007, §2142). It is respectfully submitted that one of ordinary skill in the art would have no motivation to arrive a method for forming a chopped strand mat that (1) adds a sizing liquid to strands formed of contiguous fibers and (2) forms a web by passing a white water dispersion over a forming wire where the chopped strands are retained on a forming wire to form a web of chopped strands based on the teachings of Gaa and Smith because Gaa and Smith simply do not teach or suggest a method in which a sizing liquid is applied to strands of contiguous filaments or the formation of a web of chopped strands. Moreover, Gaa teaches away from the process claimed in claim 1 where the fibers are

maintained in a strand of fibers within the chopped strand mat. Without some teaching or suggestion, there can be no motivation, and without motivation, there can be no *prima facie* case of obviousness.

Also, as discussed above, Gaa and Smith do not teach or even suggest sizing strands that contain an assembly of contiguous filaments with a sizing liquid to form sized strands or forming a web by passing a white water dispersion over a forming wire where the chopped strands are retained on a forming wire to form a web of chopped strands. Therefore, Applicant respectfully submits that Gaa and Smith, alone or in combination, fail to teach all of the claim limitations set forth in claim 1. Accordingly, it is submitted that a *prima facie* case of obviousness has not been established for this additional reason.

In view of the above, it is respectfully submitted that independent claim 1 is not taught or suggested by Gaa and Smith and that claim 1 is therefore non-obvious and patentable. With respect to dependent claims 2-3, 5-7, 10-11, 15-16, and 18, Applicant submits that because independent claim 1 is not taught or suggested by Gaa and/or Smith and because claims 2-3, 5-7, 10-11, 15-16, and 18 are dependent upon claim 1 and contains the same elements as claim 1, dependent claims 2-3, 5-7, 10-11, 15-16, and 18 are also not taught or suggested by Gaa and/or Smith.

In light of the above, Applicant submits that claims 1-3, 5-7, 10-11, 15-16, and 18 are not obvious over Gaa in view of Smith and respectfully requests reconsideration and withdrawal of this rejection.

**Rejection under 35 U.S.C. §103(a)**

Claim 4 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,810,576 to Gaa, *et al.* ("Gaa") ") in view of U.S. Patent No. 5,853,133 to Smith ("Smith") as applied to claims 1-3, 5-7, 10-11, 15-16, and 18 above, and further in view of Vinamul 8837 ("Vinamul") product specification. It is asserted that although Gaa discloses employing a film forming agent which may include a PVA polymer, Gaa does not disclose the solubility of the film former. In this regard, Vinamul is cited for assertedly teaching a PVA film forming polymer that is specifically designed for use in chopped strand mats that has the claimed solubility. The Examiner concludes that it would have been obvious to one of skill in the art to have employed the film former of Vinamul in the aqueous composition of Gaa based on its art recognized suitability for this purpose.

In response to this rejection, Applicant respectfully directs the Examiner's attention to independent claim 1 and to the arguments set forth above with respect to the rejection of claims 1-3, 5-7, 10-11, 15-16, and 18 under 35 U.S.C. §103(a) to Gaa in view of Smith and submits that claim 1 defines a process for preparing a chopped strand mat that is not taught or suggested within Gaa and Smith. Indeed, neither of Gaa or Smith teaches or suggests sizing strands formed of an assembly of contiguous filaments with a sizing liquid to form sized strands as required by claim 1. In addition, Applicant submits that the teachings of Vinamul do not add to the Examiner's rejection so as to make claim 1 unpatentable. Vinamul is silent with respect to any teaching or suggestion of sizing glass strands or forming a web of chopped strands. Even with the addition of the teachings of Vinamul, the combination of references still does not teach or suggest a method for forming a chopped strand mat that (1) adds a sizing liquid to strands formed of contiguous fibers and (2) forms a web by passing a white water dispersion over a forming wire where the chopped strands are retained on the forming wire to form a web of chopped strands as claimed in claim 1. As such, it is submitted that the combination of Gaa, Smith, and Vinamul does not teach or suggest Applicant's invention as recited in claim 1. Because claim 4 is dependent upon claim 1, which, as discussed in detail above, is not taught or suggested by Gaa, Smith, and/or Vinamul, Applicant submits that claim 4 is also not taught or suggested by Gaa, Smith, and/or Vinamul.

In view of the above, Applicant respectfully submits that claim 4 is non-obvious and patentable over the combination of Gaa in view of Smith and Vinamul and respectfully requests that the Examiner reconsider and withdraw this rejection.

**Rejection under 35 U.S.C. §103(a)**

Claims 8 and 9 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,810,576 to Gaa, *et al.* ("Gaa") ") in view of U.S. Patent No. 5,853,133 to Smith ("Smith) as applied to claims 1-3, 5-7, 10-11, 15-16, and 18 above, and further in view of U.S. Patent No. 4,526,914 to Dolin ("Dolin"). The Examiner admits that Gaa does not teach the use of a thickener. It is asserted, however, that Dolin teaches that it is desired that the viscosity of white water be between 1-12 cps, which corresponds to the claimed range. The Examiner concludes that it would have been obvious to one of skill in the art to have added the thickener disclosed by Gaa in amounts to produce the viscosity taught by

Dolin because such values were taught in the art as desirable and conventional in forming white water dispersants.

In response to this rejection, Applicant respectfully directs the Examiner's attention to independent claim 1 and to the arguments set forth above with respect to the rejection of claims 1-3, 5-7, 10-11, 15-16, and 18 under 35 U.S.C. §103(a) to Gaa in view of Smith and submits that claim 1 defines a process for preparing a chopped strand mat that is not taught or suggested within Gaa and Smith. Indeed, neither Gaa nor Smith teaches or suggests sizing strands with a sizing liquid to form sized strands where the strands contain an assembly of contiguous filaments as required by claim 1. In addition, Applicant submits that the teachings of Dolin do not add to the Examiner's rejection so as to make claim 1 unpatentable. It is respectfully submitted that Dolin does not teach or suggest sizing glass strands or forming a web of chopped strands. Therefore, even with the addition of the teachings of Dolin, Applicant submits that the cited references still do not teach or suggest a method for forming a chopped strand mat that (1) adds a sizing liquid to strands formed of contiguous fibers and (2) forms a web by passing a white water dispersion over a forming wire where the chopped strands are retained on the forming wire to form a web of chopped strands as claimed in claim 1. As such, it is submitted that the combination of Gaa, Smith, and Dolin does not teach or suggest Applicant's invention as recited in claim 1. Because claims 8 and 9 are dependent upon claim 1, which, as discussed in detail above, is not taught or suggested by Gaa, Smith, and/or Dolin, Applicant submits that claims 8 and 9 are also not taught or suggested by Gaa, Smith, and/or Dolin.

In view of the above, Applicant respectfully submits that claims 8 and 9 are non-obvious and patentable over the combination of Gaa in view of Smith and Dolin and respectfully requests that the Examiner reconsider and withdraw this rejection.

**Rejection under 35 U.S.C. §103(a)**

Claim 12 has been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,810,576 to Gaa, *et al.* ("Gaa") ") in view of U.S. Patent No. 5,853,133 to Smith ("Smith) as applied to claims 1-3, 5-7, 10-11, 15-16, and 18 above, and further in view of U.S. Patent No. 4,917,764 to Lalwani, *et al.* ("Lalwani"). The Examiner admits that Gaa does not teach the claimed temperature of the heating step. In this regard, Lalwani is cited for assertedly teaching that such heat treating steps are conventionally performed at

temperatures from 100-400 °C. The Examiner concludes that it would have been obvious to one of skill in the art to have employed temperatures as taught by Lalwani in the method taught by Gaa because such temperatures were known in the art.

In response to this rejection, Applicant respectfully directs the Examiner's attention to independent claim 1 and to the arguments set forth above with respect to the rejection of claims 1-3, 5-7, 10-11, 15-16, and 18 under 35 U.S.C. §103(a) to Gaa in view of Smith and submits that claim 1 defines a process for preparing a chopped strand mat that is not taught or suggested within Gaa and Smith. Indeed, Gaa and Smith do not teach or suggest sizing strands with a sizing liquid to form sized strands where the strands contain an assembly of contiguous filaments as required by claim 1. In addition, Applicant submits that the teachings of Lalwani do not add to the Examiner's rejection so as to make claim 1 unpatentable. Lalwani does not teach or suggest sizing glass strands or forming a web of chopped strands. It is respectfully submitted that even with the addition of the teachings of Lalwani, the cited references still do not teach or suggest a method for forming a chopped strand mat that (1) adds a sizing liquid to strands formed of contiguous fibers and (2) forms a web by passing a white water dispersion over a forming wire where the chopped strands are retained on the forming wire to form a web of chopped strands as claimed in claim 1. As such, it is submitted that the combination of Gaa, Smith, and Lalwani does not teach or suggest Applicant's invention as recited in claim 1. Because claim 12 is dependent upon claim 1, which, as discussed in detail above, is not taught or suggested by Gaa, Smith, and/or Lalwani, Applicant submits that claim 12 is also not taught or suggested by Gaa, Smith, and/or Lalwani.

In view of the above, Applicant respectfully submits that claim 12 is non-obvious and patentable over the combination of Gaa in view of Smith and Lalwani and respectfully requests reconsideration and withdrawal of this rejection.

**Rejection under 35 U.S.C. §103(a)**

Claims 13-14 and 17 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,810,576 to Gaa, *et al.* ("Gaa") ") in view of U.S. Patent No. 5,853,133 to Smith ("Smith) as applied to claims 1-3, 5-7, 10-11, 15-16, and 18 above, and further in view of U.S. Patent No. 4,112,174 to Hannes, *et al.* ("Hannes"). The Examiner admits that Gaa does not disclose the basis weight of the mat or the claimed number of

filaments. In this regard, Hannes is cited for assertedly teaching basis weights from 100-120 $g/m^2$ and strands having 1-300 filaments. The Examiner concludes that it would have been obvious to one of skill in the art to have employed the claimed number of filaments and to have formed mats having the claimed basis weights in view of the teachings of Hannes that such materials and weights were conventionally known and used.

In response to this rejection, Applicant respectfully directs the Examiner's attention to independent claim 1 and to the arguments set forth above with respect to the rejection of claims 1-3, 5-7, 10-11, 15-16, and 18 under 35 U.S.C. §103(a) to Gaa in view of Smith and submits that claim 1 defines a process for preparing a chopped strand mat that is not taught or suggested within Gaa and Smith. Indeed, neither Gaa nor Smith teaches or suggests sizing strands with a sizing liquid to form sized strands where the strands contain an assembly of contiguous filaments as required by claim 1. In addition, Applicant submits that the teachings of Hannes do not add to the Examiner's rejection so as to make claim 1 unpatentable. Even with the addition of the teachings of Hannes, Gaa and Smith still do not teach or suggest a method for forming a chopped strand mat that (1) adds a sizing liquid to strands formed of contiguous fibers and (2) forms a web by passing a white water dispersion over a forming wire where the chopped strands are retained on the forming wire to form a web of chopped strands as claimed in claim 1. As such, it is submitted that the combination of Gaa, Smith, and Hannes does not teach or suggest Applicant's invention as recited in claim 1. Because claims 13-14 and 17 are dependent upon claim 1, which, as discussed in detail above, is not taught or suggested by Gaa, Smith, and/or Hannes, Applicant submits that claims 13-14 and 17 are also not taught or suggested by Gaa, Smith, and/or Hannes.

In view of the above, Applicant respectfully submits that claims 13-14 and 17 are non-obvious and patentable over the combination of Gaa in view of Smith and Hannes and respectfully requests reconsideration and withdrawal of this rejection.

**Conclusion**

In light of the above, Applicant believes that this application is now in condition for allowance and therefore requests favorable consideration.

If any points remain in issue which the Examiner feels may be best resolved through a personal or telephone interview, the Examiner is kindly requested to contact the undersigned at the telephone number listed below.

If necessary, the Commissioner is hereby authorized to charge payment or credit any overpayment to Deposit Account No. 50-0568 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

Date: Feb. 11, 2009

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